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Research Article

Preputioplasty in Distal Hypospadias Repair with Tunica Vaginalis Flap: A Prospective Analysis

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Abstract: There is growing interest in preputial reconstruction combined with hypospadias repair as an effective technique. The objective of the following study is to assess the outcome of treatment with tunica vaginalis flap in cases of distal penile hypospadias repair with preputioplasty. We evaluated 38 males during a period of four years that underwent distal hypospadias repair combined with preputioplasty with tunica vaginalis flap to determine complications, risks and failures. Group one included cases with tunica vaginalis flap and group two included cases without it. A total of 38 procedures were done, of which 20 patients underwent distal penile hypospadias repair with preputioplasty with tunica vaginalis flap (group I), while 18 patients underwent simple urethroplasty with preputioplasty (group II). In group I one patient (5%) developed fistula, while in group II four patients (22%) developed fistula. In group I, in one patient, testis was tethered to higher level in standing position. In others, testicular mobility was normal in scrotal sac during follow up. Tunica vaginalis flap is highly effective method to provide stable and vascularised flap to cover neourethra and leave undisturbed prepuce for successful reconstruction.
Keywords: Preputioplasty, tunica vaginalis flap, distal hypospadias repair, fistula.

INTRODUCTION

The term hypospadias is derived from Greek and refers to a rent on the ventrum of the penis [1]. Hypospadias results when fusion of the urethral folds is incomplete [2]. It is defined as an atypical urethral opening anywhere along the shaft of the penis, scrotum or perineum. It is often associated with a deficient prepuce and chordee [3]. It is one of the common congenital anomaly of urethra with a reported incidence of 1 in 300.

Hypospadias repair requires considerable artistic latitude in surgical repair. 150 different procedures has been described for its surgical correction [4]. The commonest complication of hypospadias surgery is fistula formation which almost always requires repeat and equally demanding surgery [5]. Many efforts for prevention of fistulae are undertaken like overlapping suture lines, two-stage repair, burying repaired urethra in scrotum [6], dartos flap [7], subcutaneous tissue [8] rotating skin flaps etc.

Also repair of distal penile hypospadias along with preputioplasty is technically challenging to the surgeon as most of the technique of urethroplasty required some sort of soft tissue flap which is harvested from prepuce thus excludes its reconstruction [9].

Thus our aim was to compare the effectiveness of tunica vaginalis flap in preputioplasty when it is done with and without it. Tunica vaginalis is selected as tunica vaginalis flap from the parietal layer of testis. Cover of anastomosis of urethroplasty is one more option which helps in the reduction of urethro-cutaneous fistulae [10]. This flap was first time introduced by Snow et al in primary hypospadias repair as well as in urethrocutaneous fistula cases [11]. It has been reported that the results are better with flap urethroplasties than grafts. Importantly, the prepuce can be preserved and refashioned to give a good cosmetic result, which is increasingly important as circumcision becomes less acceptable to both the general public and the medical profession.

MATERIALS AND METHODS

A prospective analysis of cases managed between 2012 to 2015 was done. Patients were divided into two groups. Group one included distal penile hypospadias repair with preputioplasty with tunica vaginalis flap and group two included distal penile

hypospadias repair with preputioplasty without tunica vaginalis flap. Parents were informed about the goals of surgery, plan of surgical repair and common complications. All the operations were done by same surgeon.

In group one, testis was delivered into operative field by separate scrotal incision [3] and parietal layer of tunica vaginalis was incised near the lower pole of testis and harvested as a proximal based flap which is reached through subcutaneous tunnel into neo urethra site and sutured into place by 6-0 polyglactin 910 [10,12,13]. Figure 1-2 shows harvesting of tunica vaginalis flap. Preputioplasty was done by repairing both inner and outer layer of prepuce by simple interrupted 6-0 polyglactin 910 [14]. Figure 3-6 shows preputioplasty and formation of neourethra. Bipolar diathermy was used for meticulous dissection and non bloody field, as minimal is the tissue trauma, lesser is the vascularity compromised and better is the healing process [1]. In group 2 simple urethroplasty with preputioplasty was done.

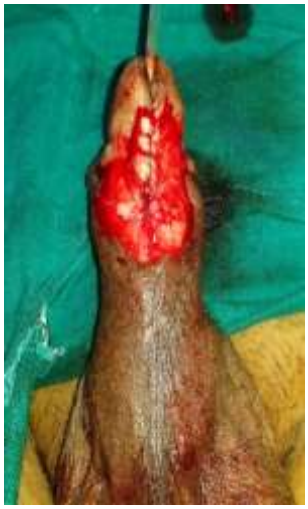

Fig-1: clinical picture showing formation of neourethra complete

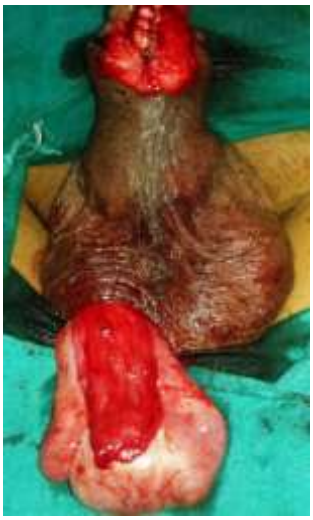

Fig-2: Harvesting of tunica vaginalis flap

Fig-3: Harvesting of tunica vaginalis flap

Fig- 4: clinical picture showing neourethra coverwith tunica vaginalis flap

Fig-5: clinical photograph depicting preputioplasty

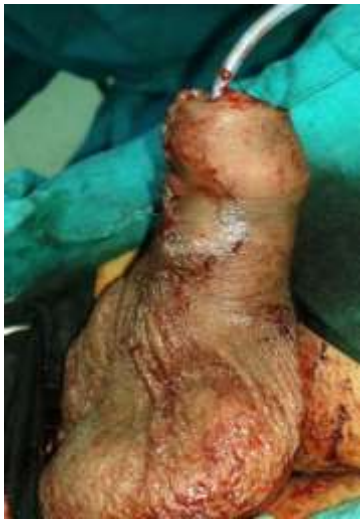

Fig-6: clinical photograph depicting preputioplasty

RESULTS

A total of 38 procedures were done during the period of above mentioned years. Of these, 20 patients had distal penile hypospadias repair with preputioplasty with tunica vaginalis flap (group I) while 18 pateints underwent simple urethroplasty with preputioplasty (group II). In group I one patient (5%) developed fistula, while in group II four patients (22%) developed fistula. In group I, in one patient, testis was tethered to higher level in standing position. In others, testicular mobility was normal in scrotal sac during follow up. Table 1 and figure 7, shows the prospective analysis of distal penile hypospadias repair with preputioplasty with and without tunica vaginalis flap.

Table 1: Prospective analysis of distal penile hypospadias repair with preputioplasty with and without tunica vaginalis flap.

	No. of patients	Fistula develop	% fistula
Group 1	20	1	5
Group 2	18	4	22

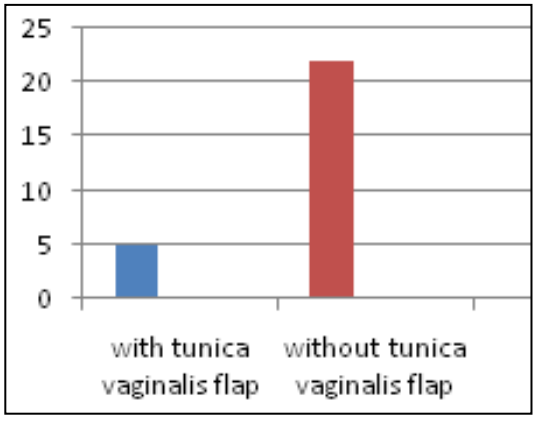

Fig-7: Percentage of incidence of fistula in distal penile hypospadias repair with preputioplasty with and without tunica vaginalis flap.

DISCUSSION

Hypospadias is one of the common congenital anomaly of urethra[1]. Purpose of hypospadias surgery is restoration of functionally normal as well as preservation of cosmetic appearance of penis. Circumcision becomes less acceptable to both the general public and the medical profession; the prepuce can be preserved and refashioned to achieve good cosmetic results[15]. The child is also psychologically benefited as he feels equal to his counterparts. Additionally, it serves as a skin reserve where, should the hypospadias repair fail, the inner prepuce can be utilized in repair[16].

Hypospadias is one of the most common anomalies in males with urethro-cutaneous fistula being the most common postoperative complication. Better suture materials, use of magnification, dorsal subcutaneous flap, silicone stents and catheters have all contributed to a decrease in fistula rate[17]. The incidence of fistula can be used to judge the success of hypospadias surgery[18]. In our study the incidence of fistula with tunica vaginalis flap was 5% while without use of tunica vaginalis flap was 22%. Thus use of tunica vaginalis flap is definitely a means of reducing complications.

Durham Smith in a study of hypospadias surgery noted varied fistula rates for different procedures. Flip-flap repair varied from 2.2 to 35%, island pedicle tube flap 4 to 35%, free graft tube flap had a fistula rate of 15 to 50%[19].

As most of the technique of urethroplasty required some sort of soft tissue flap to cover neourethra which is harvested from prepuce thus excludes its reconstruction. By using tunica vaginalis flap it leaves undisturbed prepuce to be reconstructed successfully. On mobilisation tunica vaginalis can cover neo urethra up to glans thus reducing fistula rate.

Tunica vaginalis as graft supplement for deficient tunica albugenia in occasional case of severe chordee has been used since a long time. It was in fact preferred by Baskin et al, for its elastic nature, an advantage over lyophilized dura or dermis [20]. It has a dependable blood supply from the cremasteric vessels and its pedicle length can safely be increased up to the external inguinal ring. Care must be taken while increasing pedicle length as the tissue becomes more flimsy proximally and at the same time inadequate pedicle length can cause tethering of the testis at a higher level compared to the normal side in an erect position as was the case in one of our patients. Similar findings have been reported by Handoo in his study[10].

COCLUSIONS

When parents are willing to have an intact prepuce then preputioplasty is done along with distal hypospadias repair, and tunica vaginalis flap provide

effective and viable cover for neourethra and leaves virgin prepuce to be reconstructed successfully.

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